WHAT IS CLAIMED IS:

1. A collection of particles comprising a crystalline composition with a phosphate anion, the collection of particles having an average particle size less than about 1000 nm.

2. The collection of particles of claim 1 having an average particle size from 5 nm to about 250 nm.

3. The collection of particles of claim 1 having an average particle size from 5 nm to about 100 nm.

4. The collection of particles of claim 1 having a plurality of metals in the composition.

5. The collection of particles of claim 4 wherein one of the plurality of metals is lithium.

6. The collection of particle of claim 1 having at least three metals within the composition.

7. The collection of particles of claim 1 wherein the composition comprises Li_xFePO_4, $0.1 \le x \le 1$.

8. The collection of particles of claim 1 wherein the composition comprises $LiFe_{1-x}Mn_xPO_4$, $0 \le x \le 0.8$.

9. The collection of particles of claim 1 wherein the composition comprises $LiFe_{1-x}Mn_xPO_4$, $0.4 \le x \le 0.8$.

10. The collection of particles of claim 1 wherein the composition comprises M_xPO_4, wherein M is a metal, x is a rational number and $x \le 4$.

11. The collection of particles of claim 1 wherein the composition comprises $Fe_3(PO_4)_2$.

12. The collection of particles of claim 1 wherein the composition comprises $FePO_4$.

13. The collection of particles of claim 1 having essentially no particle with an diameter greater than about 5 times the average particle size.

14. The collection of particles of claim 1 having essentially no particle with an diameter greater than about 3 times the average particle size.

15. The collection of particles of claim 1 having a distribution of particle sizes such that at least about 95 percent of the particles have a diameter greater than about 40 percent of the average diameter and less than about 160 percent of the average diameter.

16. A battery comprising an cathode, the cathode comprising the collection of particles of claim 1, the particles comprising lithium metal phosphate.

17. The battery of claim 16 wherein the lithium metal phosphate comprises Li_xFePO_4.

18. The battery of claim 16 wherein the lithium metal phosphate comprises $LiFe_{1-x}Mn_xPO_4$, where $0.6 \leq x \leq 0.8$.

19. The battery of claim 16 comprising an anode having lithium metal.

20. The battery of claim 16 comprising an anode having a lithium intercalation compound.

21. A collection of particles comprising a collection of amorphous particles, the particles comprising a phosphate composition having an average particle size less than about 95 nm.

22. A method for producing particles comprising a composition with a polyatomic anion, the method comprising reacting a reactant stream in a gas flow, the reactant stream comprising an aerosol, the aerosol comprising a polyatomic anion precursor, the polyatomic anion precursor comprising a phosphorous precursor, a sulfur precursor or a silicon precursor.

23. The method of claim 22 wherein the reaction is driven by energy from a light beam.

24. The method of claim 23 wherein the light beam is an infrared laser beam.

25. The method of claim 22 wherein the polyatomic anion precursor comprises a phosphorous precursor.

26. The method of claim 25 wherein the phosphorous precursor comprises PO_4^{-3}.

27. The method of claim 25 wherein the phosphorous precursor comprises $POCl_3$.

28. The method of claim 22 wherein the polyatomic anion precursor comprises a sulfur precursor.

29. The method of claim 27 wherein the sulfur precursor comprises SO_4^{-2}.

30. The method of claim 28 wherein the sulfur precursor is selected from the group consisting of $SOCl_2$ and SO_2Cl_2.

31. The method of claim 22 wherein the polyatomic anion precursor comprises a silicon precursor.

32. The method of claim 31 wherein the silicon precursor comprises SiO_4^{-4}.

33. The method of claim 31 wherein the silicon precursor comprises $SiCl_4$.

34. The method of claim 31 wherein the silicon precursor comprises tetramethylammonium silicate.

35. The method of claim 22 wherein the aerosol comprises an aqueous solution.

36. The method of claim 22 wherein the reactant stream further comprises a lithium precursor.

37. The method of claim 22 wherein the reactant stream further comprises a plurality of metals.

38. The method of claim 22 wherein the reactant stream further comprises lithium precursors and iron precursors.

39. A method for producing particles comprising a composition with a polyatomic anion, the method comprising reacting a reactant stream in a gas flow, the reactant stream comprising a polyatomic anion precursor, the polyatomic anion precursor comprising a phosphorous

precursor, a sulfur precursor or a silicon precursor and the reaction being driven by an intense light beam.

40. A method for producing lithium iron phosphate, the method comprising reacting a lithium precursor, an iron precursor and a phosphorous precursor in the presence of O_2 to produce crystalline lithium iron phosphate.

41. A method for producing a collection of particles comprising a mixed metal phosphate compound, the collection of particles having an average particle size of no more than 1000 nm, the method comprising heating submicron metal oxide particles combined with ammonium phosphate.

42. The method of claim 41 wherein the ammonium phosphate comprises $NH_4H_2PO_4$.

43. The method of claim 41 wherein the metal oxide comprises a mixture of two different metal oxides.

44. The method of claim 41 wherein the metal oxide comprises Li_2CO_3.

45. The method of claim 41 wherein the metal oxide and ammonium phosphate is also combined with Li_2CO_3.

46. A method of coating a substrate, the method comprising:

reacting a reactant stream by directing a focused radiation beam at the reactant stream to produce a product stream comprising particles downstream from the radiation beam, wherein the reaction is driven by energy from the radiation beam, the reactant stream comprising a polyatomic anion precursor, the polyatomic anion precursor comprising a phosphorous precursor, a sulfur precursor or a silicon precursor;

directing the product stream to a substrate to coat the substrate.

47. The method of claim 46 further comprising moving the substrate relative to the product stream.